

REMARKS

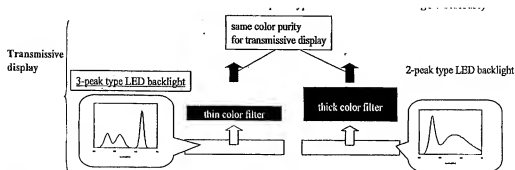
Claims 1, 3 and 17-20 stand rejected under 35 USC 103(a) as being unpatentable over Nakagi in view of Chang, Koike, and Kim. This rejection is respectfully traversed.

In rejecting the claims the Examiner states that

[I]t would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a transfective liquid crystal display device as taught by Nakagi wherein apertures are formed in the reflective region as taught by Kim et al., since Kim et al. teach that by forming apertures in the reflective region helps to adjust the characteristics of color and the brightness of the display device (Paragraph 0053) and wherein colorless regions are formed in the transmissive portion of a color filter layer as taught by Koike et al., since Koike et al. teach that an improvement in color reproducibility on the color filters can be achieved (Paragraph 0050) and further wherein the backlight source is a three-peak type LED backlight as taught by Chang et al., since Chang et al. teach that by using the three-peak type LED backlight together with the color filters enhances the color saturation at the backlight mode while maintaining the displaying effect of high reflectance (Column 7, lines 46-47 and Column 8, lines 5-18).

As previously explained, claims 1 and 3 claim transfective liquid crystal displays that include the following combination of features: 1) a color filter having a transmissive region and a reflective region which are provided in each picture element of the color filter and which have colored layers comprising a single material, 2) a three-peak type LED backlight source being used as the backlight source, 3) and an aperture that is formed in the reflective region. The combination of these elements as disclosed in the specification and as claimed produce unexpectedly superior properties than displays using any one or any two of these elements. The unexpected benefits of utilizing these elements in combination as claimed are explained below. Since all of these elements are required to achieve the claimed characteristics, and since none of the cited references disclose or suggest this claimed combination, the claimed combination would not be obvious in view of the cited art.

Applicants have found the following :1) As shown below, by utilizing a 3-peak type LED backlight the thickness of the color filter in the transmissive region can be thinned.



2) In addition, the thickness of this color filter in the reflective display region can also be thinned by utilizing the 3-peak type LED. 3) The optical properties including brightness and color reproducibility (color gamut) obtained using the thin color filter in the reflective display region is better than those of a thick color filter. The benefits achieved by utilizing the thin color filter with the same color layer thickness in both regions of the display in combination with the 3-peak type LED, and the aperture were not known.

The benefits obtained by the combination of these features are shown by Examples 1 and 2, and by Comparative Example 1. Examples 1 and 2 both use a 3-peak type LED backlight. As explained above, the use of the 3-peak type LED backlight allows for a thinner color filter to be used in the claimed display. Comparative Example 1 utilizes a 2-peak type LED, and therefore as pictured above, a thicker color filter was required in order to achieve the same color purity. In Example 1, the use of the 3-peak type LED backlight, with the thin color filter and aperture produced a display with a wider color gamut and the same brightness as Comparative Example 1. In Example 2, the use of the 3-peak type LED backlight, with the thin color filter and aperture produced a display with the same color gamut and increased brightness as compared to Comparative Example 1.

Further, the size of the aperture can also be decreased when a thin color layer is used. This is because a large aperture is required with a thick color layer in order to obtain the desirable reflectance. However, this larger aperture allows for more unfiltered light to pass through the layer, decreasing the optical properties of the color filter.

The Examiner has cited to Koiki as disclosing the claimed color filter for use in combination with a 3-peak type LED backlight. Koiki, however, actually teaches away from the claimed combination. As described above, the use of the 3-peak type LED backlight allows for the color filter with aperture to be thinned. Koiki, however, discloses the following:

Sample	optical properties of color resin					optical properties of color filter substrate				
	thickness	color	Y(%)	x	y	area ratio	color	Y(%)	x	y
S0	1.3 μ m	R	21	0.6	0.34	100%	R	21	0.6	0.34
		G	49	0.3	0.54		G	49	0.3	0.54
		B	15	0.14	0.13		B	15	0.14	0.13
		W	29	0.3	0.32		W	29	0.3	0.32
S1	1.63 μ m	R	18	0.64	0.33	80%	R	21	0.6	0.34
		G	43	0.3	0.57		G	49	0.3	0.54
		B	12	0.14	0.12		B	15	0.14	0.13
		W	25	0.3	0.31		W	29	0.3	0.32
S2	1.3 μ m	R	21	0.6	0.34	20%	R	63	0.37	0.33
		G	49	0.3	0.54		G	79	0.3	0.37
		B	15	0.14	0.13		B	52	0.22	0.26
		W	29	0.3	0.32		W	64	0.3	0.32

As shown above, Koike intends to produce the same optical properties in S0 and S1 regardless of the thickness of the color filter. Accordingly, Koike actually teaches away from using a thinner filter to improve the optical properties in both the transmissive region and the reflective region of the display. Further, since the claimed properties are obtained by using this thinner color filter with aperture in combination with the 3-peak type LED backlight, the claimed transfective display is not disclosed or suggested by the cited references.

Since none of the cited references disclose or suggest utilizing all of the claimed features in combination as claimed, the rejection of claims 1, 3 and 17-20, should be withdrawn.

In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. **360842011300**.

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Respectfully submitted,

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